## **CLAIMS**

## What Is Claimed Is:

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•	1	1. A method for positioning a tunneling tip at a spacing of one nanometer from a
•	2	conducting surface comprising the steps of:
	3	depositing a quantity of fullerene C <sub>60</sub> on the conducting surface;
	4	removing all but a monolayer film of fullerene C <sub>60</sub> on the conducting
	5	surface;
3	6	applying an electrical bias to the tunneling tip;
	7	moving the tunneling tip toward the conducting surface with the
D N	8	fullerene C <sub>60</sub> film between the tunneling tip and the conducting surface;
	9	monitoring for conductance between the tunneling tip and the fullerene
	10	C <sub>60</sub> film; and
	11	fixing the position of the tunneling tip with respect to the conducting
	12	surface when a said monitoring indicates that the tunneling tip is in contact
	13	with the fullerene C <sub>60</sub> film.
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1	2. A removable packaging method for establishing a one narrometer spacing
2 -	between electrically conducting components comprising the steps of:
	depositing a monolayer of C <sub>60</sub> fullerene on a first fixed conductive
3	
4	surface;
5	moving a second conductive surface with an electrical bias adjacent to
6	the first conductive surface at a location where current is transferred to the
7	monolayer of C <sub>60</sub> fullerene;
8	breaking down the fullerene C <sub>60</sub> into carbonaceous byproducts;
9	introducing a gas selected to react with the carbonaceous byproducts to
10	form a stable molecular gas; and
11	providing a sacrificial surface to selectively adsorb the stable
12	molecular gas.
1	3. A method for inhibiting contact between a tunneling tip and a conducting
2	substrate comprising the steps of:
3	depositing a monolayer of fullerene C <sub>60</sub> on the conducting substrate;
4	providing the tunneling tip with an electrical bias;
	moving the tunneling tip to a position adjacent the conducting substrate
5	
6	and fixing the tunneling tip position with respect to the conducting substrate
7	when an electrical current is detected in the fullerene C <sub>60</sub> monolayer due to the
8	presence of the tunneling tip;
9	energizing the monolayer of fullerene C <sub>60</sub> to breakup the monolayer

10	into carbonous byproducts; and
11	removing the carbonous byproducts, leaving the tunneling tip fixed at
12	said fixed position
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1	4. A method for separating an electron-donating tunneling surface from an
2	electron-receiving surface at a distance of on nanometer comprising the steps of:
3	establishing a monolayer of fullerene on the electron-receiving surface,
4	where said fullerene has a monolayer thickness of one nanometer;
5	providing an electrical bias on the electron-donating tunneling surface;
6	bringing the electron-donating tunneling surface into contact with the
7	monolayer of fullerene on the electron-receiving surface; and
8	establishing an electrical current between the electron-donating
9	tunneling surface and the electron-receiving surface, said electrical current
10	communicating across the monolayer of fullerene.
1	5. A method for manufacturing a MEMS device with a protective coating
2	comprising the steps of:
3	depositing via sublimation a fullerene layer onto a gold surface of a
4	conducting substrate;
5	providing an electrical bias on a gold-plated tunneling tip;
6	moving the tunneling tip towards the conducting substrate, and monitoring the

7	conductivity in the fullerene layer;
8	fixing the position of the tunneling tip when the monitoring of the conductivity
9	in the fullerene layer indicates that the tunneling tip is in contact with the fullerene
10	layer;
11	applying thermal energy to the fullerene layer after the tunneling tip position
.12	has been fixed to break up the fullerene layer into carbon byproducts;
13	introducing a gas to react with the carbon byproducts to form a carbon based
14	gas; and
15	adsorbing the carbon based gas onto a prefabricated sacrificial surface leaving
16	a region adjacent the tunneling tip free of fullerene and fullerene byproducts.
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	6. carbon based protective padding for a MEMS device, the carbon based
2	protective radding further adapted to accurately and reliably establish a one
. 3	nanometer spacing between a conducting surface on the MEMS device and a
4	tunneling tip, the carbon based protective padding comprising a film of fullerene C60
5	having a thickness of one molecule, said film located at the conducting surface
6	between the tunneling tip and the conducting surface.

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